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APPLICATION NO.	FILED DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/701,585	01/02/2001	Tetsuya Fukunaga	199589USOPCT	6219
22850	7590	08/09/2002	EXAMINER	
OBLON SPIVAK MCCLELLAND MAIER & NEUSTADT PC FOURTH FLOOR 1755 JEFFERSON DAVIS HIGHWAY ARLINGTON, VA 22202			MEDINA SANABRIA, MARIBEL	
ART UNIT		PAPER NUMBER		
1754		7		DATE MAILED: 08/09/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	Application No.	Applicant(s)
	09/701,585	FUKUNAGA, TETSUYA
<b>Period for Reply</b>	Examiner	Art Unit
	Maribel Medina	1754
<i>-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --</i>		
<b>A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.</b>		
<ul style="list-style-type: none"> <li>- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.</li> <li>- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.</li> <li>- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.</li> <li>- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).</li> <li>- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).</li> </ul>		
<b>Status</b>		
1) <input checked="" type="checkbox"/> Responsive to communication(s) filed on <u>02 January 2001</u> . 2a) <input type="checkbox"/> This action is FINAL.                            2b) <input checked="" type="checkbox"/> This action is non-final. 3) <input type="checkbox"/> Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under <i>Ex parte Quayle</i> , 1935 C.D. 11, 453 O.G. 213.		
<b>Disposition of Claims</b>		
4) <input checked="" type="checkbox"/> Claim(s) <u>1-31</u> is/are pending in the application. 4a) Of the above claim(s) _____ is/are withdrawn from consideration. 5) <input type="checkbox"/> Claim(s) _____ is/are allowed. 6) <input checked="" type="checkbox"/> Claim(s) <u>1-31</u> is/are rejected. 7) <input type="checkbox"/> Claim(s) _____ is/are objected to. 8) <input type="checkbox"/> Claim(s) _____ are subject to restriction and/or election requirement.		
<b>Application Papers</b>		
9) <input type="checkbox"/> The specification is objected to by the Examiner. 10) <input checked="" type="checkbox"/> The drawing(s) filed on <u>02 January 2001</u> is/are: a) <input type="checkbox"/> accepted or b) <input checked="" type="checkbox"/> objected to by the Examiner. Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a). 11) <input type="checkbox"/> The proposed drawing correction filed on _____ is: a) <input type="checkbox"/> approved b) <input type="checkbox"/> disapproved by the Examiner. If approved, corrected drawings are required in reply to this Office action. 12) <input type="checkbox"/> The oath or declaration is objected to by the Examiner.		
<b>Priority under 35 U.S.C. §§ 119 and 120</b>		
13) <input checked="" type="checkbox"/> Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f). a) <input checked="" type="checkbox"/> All    b) <input type="checkbox"/> Some * c) <input type="checkbox"/> None of: 1. <input type="checkbox"/> Certified copies of the priority documents have been received. 2. <input type="checkbox"/> Certified copies of the priority documents have been received in Application No. _____. 3. <input checked="" type="checkbox"/> Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)). * See the attached detailed Office action for a list of the certified copies not received.		
14) <input type="checkbox"/> Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application). a) <input type="checkbox"/> The translation of the foreign language provisional application has been received. 15) <input type="checkbox"/> Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.		
<b>Attachment(s)</b>		
1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____. 4) <input type="checkbox"/> Interview Summary (PTO-413) Paper No(s) _____. 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) 6) <input type="checkbox"/> Other: _____.		

**Detailed Action**

**Information Disclosure Statement**

1. The references cited in the Search Report JPO have been considered, but will not be listed on any patent resulting from this application because they were not provided on a separate list in compliance with 37 CFR 1.98(a)(1). In order to have the references printed on such resulting patent, a separate listing, preferably on a PTO-1449 form, must be filed within the set period for reply to this Office action.

**Priority**

2. Receipt is acknowledged of papers submitted under 35 U.S.C. 119(a)-(d), which papers have been placed of record in the file.

**Drawings**

3. The drawings are objected to as failing to comply with 37 CFR 1.84(p)(5) because they include the following reference sign(s) not mentioned in the description: Figure 1, includes (1), (2), (3) and (9); Figure 3, includes (2); and Figure 4 includes (2). A proposed drawing correction, corrected drawings, or amendment to the specification to add the reference sign(s) in the description, are required in reply to the Office action to avoid abandonment of the application. The objection to the drawings will not be held in abeyance.

**Claim Rejections - 35 USC § 112**

4. Claims 12-31 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

a. Claim 12 provides for the use of an autothermal reforming catalyst, but, since the claim does not set forth any steps involved in the method/process, it is unclear what method/process applicant is intending to encompass. A claim is indefinite where it merely recites a use without any active, positive steps delimiting how this use is actually practiced.

Claim 12 is rejected under 35 U.S.C. 101 because the claimed recitation of a use, without setting forth any steps involved in the process, results in an improper definition of a process, i.e., results in a claim which is not a proper process claim under 35 U.S.C. 101. See for example *Ex parte Dunki*, 153 USPQ 678 (Bd.App. 1967) and *Clinical Products, Ltd. v. Brenner*, 255 F. Supp. 131, 149 USPQ 475 (D.D.C. 1966).

b. Claims 17 and 18 provide for the use of carbon dioxide, but, since the claims do not set forth any steps involved in the method/process, it is unclear what method/process applicant is intending to encompass. A claim is indefinite where it merely recites a use without any active, positive steps delimiting how this use is actually practiced.

Claims 17 and 18 are rejected under 35 U.S.C. 101 because the claimed recitation of a use, without setting forth any steps involved in the process, results in an improper definition of a process, i.e., results in a claim which is not a proper process claim under 35 U.S.C. 101. See for example *Ex parte Dunki*, 153 USPQ 678 (Bd.App. 1967) and *Clinical Products, Ltd. v. Brenner*, 255 F. Supp. 131, 149 USPQ 475 (D.D.C. 1966).

c. Claim 28 provides for the use of carbon dioxide and a catalyst for reforming hydrocarbon, but, since the claim does not set forth any steps involved in the method/process, it is unclear what method/process applicant is intending to encompass.

A claim is indefinite where it merely recites a use without any active, positive steps delimiting how this use is actually practiced.

Claim 28 is rejected under 35 U.S.C. 101 because the claimed recitation of a use, without setting forth any steps involved in the process, results in an improper definition of a process, i.e., results in a claim which is not a proper process claim under 35 U.S.C. 101. See for example *Ex parte Dunki*, 153 USPQ 678 (Bd.App. 1967) and *Clinical Products, Ltd. v. Brenner*, 255 F. Supp. 131, 149 USPQ 475 (D.D.C. 1966).

d. Claim 30 provides for the use of a catalyst for reforming hydrocarbon, but, since the claim does not set forth any steps involved in the method/process, it is unclear what method/process applicant is intending to encompass. A claim is indefinite where it merely recites a use without any active, positive steps delimiting how this use is actually practiced.

Claim 30 is rejected under 35 U.S.C. 101 because the claimed recitation of a use, without setting forth any steps involved in the process, results in an improper definition of a process, i.e., results in a claim which is not a proper process claim under 35 U.S.C. 101. See for example *Ex parte Dunki*, 153 USPQ 678 (Bd.App. 1967) and *Clinical Products, Ltd. v. Brenner*, 255 F. Supp. 131, 149 USPQ 475 (D.D.C. 1966).

e. Claim 31 provides for the use of a mixture of carbon dioxide and steam and a catalyst for reforming hydrocarbon, but, since the claim does not set forth any steps involved in the method/process, it is unclear what method/process applicant is intending to encompass. A claim is indefinite where it merely recites a use without any active, positive steps delimiting how this use is actually practiced.

Claim 31 is rejected under 35 U.S.C. 101 because the claimed recitation of a use, without setting forth any steps involved in the process, results in an improper definition of a process, i.e., results in a claim which is not a proper process claim under 35 U.S.C. 101. See for example *Ex parte Dunki*, 153 USPQ 678 (Bd.App. 1967) and *Clinical Products, Ltd. v. Brenner*, 255 F. Supp. 131, 149 USPQ 475 (D.D.C. 1966).

**Claim Rejections - 35 USC § 102**

5. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

6. Claims 1-4, 6-7, 10-14, 16, 17-20, 22-23, 26-27, and 30-31 are rejected under 35 U.S.C. 102(b) as being anticipated by US 5,130,114 (Igarashi).

In regards to claims 1 and 17, Igarashi discloses a catalyst comprising a zirconia carrier carrying ruthenium (See col. 2, lines 24-26). In regards to claims 2, 7, 18, and 23, Igarashi discloses in col. 3, lines 12-25, that alumina may be used as a carrier along with zirconium, they can be used as mixtures, or compositions such as composite oxides or composites comprising the zirconium compound supported or coated on other carriers (i.e. alumina). In regards to claims 3 and 19, it is disclosed in col. 3, lines 35-37, that ruthenium is supported on the zirconia in the range of 0.1 to 5% by weight. In regards claims 4, 6, 20 and 22, Igarashi discloses a catalyst comprising ruthenium and magnesium supported on a zirconia carrier (See col. 2, lines 27-26), wherein the magnesium composition is within the range of 0.3 to 5% by weight (See col. 5, lines 5-10). Alternatively it is disclosed that the zirconia may be stabilized with magnesium

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oxide (See col. 5, lines 55-67). In regards to claims 10, 11, 26 and 27 it is disclosed in col. 3, lines 44-50, that the catalyst may be prepared by any known process such as impregnation, dipping, wet adsorption, dry adsorption, CVD, solvent evaporation, dry mixing, wet mixing, spray coating and combinations thereof. In col. 5, lines 14-25, it is disclosed that the zirconia carrier is dipped in a solution of a colloidal dispersion of ruthenium, and magnesium. Regarding claims 12-14, Igarashi disclose the use of the above cited catalyst for producing hydrogen or synthesis gas by reforming hydrocarbons such as straight chain or branched chain saturated aliphatic hydrocarbons (See col. 7, lines 34-44). No difference is seen between the instantly claimed invention and Igarashi's disclosure.

7. Claims 1, 2, 3, 4, 5, 7, 10, 12, 13, 14, 16, 17, 18, 19, 20, 21, 23, 26, and 30-31 are rejected under 35 U.S.C. 102(b) as being anticipated by US 5,134,109 9 (Uchiyama et al).

In regards to claims 1 and 17, Uchiyama et al discloses a catalyst comprising a zirconia carrier carrying ruthenium (See col. 2, lines 48-52). In regards to claims 2, 7, 18, and 23, Uchiyama et al discloses in col. 3, lines 1-20, that alumina may be used as a carrier along with zirconium. In regards to claims 3 and 19, it is disclosed in col. 7, lines 14-20, that ruthenium is supported on the zirconia in the range of 0.01 to 5% by weight. In regards claims 4, 5, 20 and 21, Uchiyama et al discloses a catalyst comprising ruthenium and cobalt supported on a zirconia carrier (See col. 7, lines 47-51), wherein the cobalt composition is within the range of 0.1 to 10% by weight (See col. 8, lines 20-25). In regards to claims 10, 11, 26 and 27 it is disclosed in col. 9, lines 30-43, that the catalyst may be prepared by any known process such as impregnation, ion exchange, wet adsorption, dry adsorption, CVD, solvent evaporation, dry mixing, wet mixing, spray coating and combinations thereof and the resulting catalyst may be

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used after appropriate calcining. Regarding claims 12-14, Uchiyama et al disclose the use of the above cited catalyst for producing hydrogen or synthesis gas by reforming hydrocarbons such as naphtha (See col. 13, line1). No difference is seen between the instantly claimed invention and Uchiyama et al's disclosure.

### **Claim Rejections - 35 USC § 103**

8. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

9. Claims 8, 9, 15, 24 and 25 are rejected under 35 U.S.C. 103(a) as being unpatentable over Igarashi or Uchiyama et al.

Igarashi or Uchiyama et al apply herein as above. In regards to claim 8 and 24, the above cited references disclose the use of alumina as a carrier but fail to disclose or suggest the use of  $\alpha$ -alumina or  $\gamma$ - alumina as the source for the alumina carrier. It would have been obvious to one of ordinary skill in the art at the time the invention was made to have used any of  $\alpha$ -alumina or  $\gamma$ - alumina as the source for the alumina carrier for any of Igarashi or Uchiyama et al catalyst, since these types of alumina are very well known in the art and since it has been held to be within the general skill of a worker in the art to select a known material on the basis of its suitability for the intended uses as a matter of obvious design choice. *In re Leshin*, 125 USPQ 416.

Regarding claims 9 and 25, none of the references discloses the percentage weight composition of zirconium when alumina is used as catalyst carrier. It would have been obvious

to one having ordinary skill in the art at the time the invention was made to have determined by experimentation the optimum value of zirconium in the catalyst, since it has been held that discovering an optimum value of a result effective variable involves only routine skill in the art.

*In re Boesch*, 617 F.2d 272, 205 USPQ 215 (CCPA 1980).

In regards to claims 15, none of the cited reference disclose the reforming of methanol, ethanol or dimethyl ether. However, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have used any of the above cited compounds for producing hydrogen or synthesis gas, since it is well known in the art to steam reform them for this purpose.

10. Claims 28-29 are rejected under 35 U.S.C. 103(a) as being unpatentable over Igarashi as applied to claims 1-4, 6-7, 10-14, 16, 17-20, 22-23, 26-27, and 30-31 above, and further in view of EP 734086 (Olsen et al).

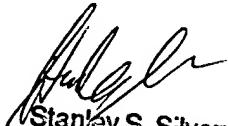
Igarashi applies herein as above. Igarashi fails to disclose the use of his catalyst for reforming of hydrocarbon by the use of carbon dioxide. Olsen et al is relied upon to teach the use of catalysts comprising ruthenium-containing catalysts for hydrocarbon reforming by use of carbon dioxide (See col. 1, lines 36-58, and col. 2, lines 55-58). It would have been obvious to one of ordinary skill in the art at the time the invention was made to have used the catalyst described in Igarashi for reforming hydrocarbons by the use of carbon dioxide, since Olsen et al clearly discloses that ~~stem~~ reforming catalysts containing ruthenium (i.e. the catalyst described by Igarashi), can be used for his process.

### **Conclusion**

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11. Any inquiry concerning this communication or earlier communications from the examiner should be directed to the examiner Maribel Medina. The examiner can normally be reached on Monday through Friday from 9:00 AM to 5:30 PM. Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0661.

Examiner: Maribel Medina   
Tel: 703-305-1928  
Fax: 703-872-9310  
August 7, 2002



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